



EX-09-07

Mapping Field Trial IV Habitat Characterization

Cordell Bank & Gulf of the Farallones National Marine Sanctuaries Expansion Areas

CRUISE INSTRUCTIONS

NOAA Ship *Okeanos Explorer*
July 14 – July 23, 2009

John McDonough, Deputy Director
Office of Ocean Exploration and Research
NOAA Office of Oceanic and Atmospheric Research

CAPT Michael S. Devany, Commanding Officer
Marine Operations Center Atlantic
NOAA Office of Marine and Aviation Operations

1 CRUISE INSTRUCTIONS

1.1 Cruise Title: Mapping Field Trial IV

1.2 Cruise Number: EX-09-07

1.3 Cruise Dates

1.3.1 Departure: July 14, 2009, Depart Astoria, OR

1.3.2 Arrival: July 23, 2009, San Francisco, CA

1.4 Operating Area

Cordell Bank National Marine Sanctuary (CBNMS) is an extremely productive marine environment off the coast of northern California. The sanctuary is entirely offshore, with the eastern boundary six miles from shore and the western boundary 30 miles offshore at the 2000 meter depth contour. The deep-sea environment of CBNMS ranges from 200 meters (the approximate depth of the continental shelf break) to 2000 meters at the sanctuary's western boundary. Of the total seafloor area in the CBNMS, approximately 479 square kilometers (185 square miles), or 35 percent, is located in the deep sea and waiting to be explored. There is virtually no information on the habitats and biological communities within the deep-sea portion of the sanctuary, including several submarine canyons that cut into the continental slope. It is expected that these deep areas harbor important habitats and communities within the Sanctuary, but management has no information on this important and sensitive environment.

Bodega Canyon is the largest of all the submarine canyons in the area and one of several large canyons in California. It is hypothesized that much of the productivity that makes Cordell Bank such a special place is linked to Bodega Canyon. The canyon has been identified as a potential source of nutrients and krill that are critical links in the Cordell Bank ecosystem. And if Bodega Canyon is similar to other prominent submarine canyons, it contains steep rock outcrops that support sensitive deep water corals and sponges, which provide habitat for an abundance of fish and mobile invertebrates. This significant seafloor feature is 20 km long and over 1600 m deep, cuts through the continental slope and shelf and is located 5-10 km north of the sanctuary boundary. Currently, there is legislation to expand Cordell Bank National Marine Sanctuary & Gulf of the Farallones National Marine Sanctuary to the north, which would include Bodega Canyon.

The proposed HR223 Expansion Areas of Cordell Bank & Gulf of the Farallones contains large areas of unsurveyed deep water slope in which additional critical deep sea coral habitat may exist. There may not be another opportunity to map and characterize these deep water habitats into the distant future.

The Farallon Escarpment is located just south of Cordell Bank boundaries inside and outside of the current Gulf of the Farallones boundaries and includes several unnamed canyons of interest, as well as Pioneer Canyon in which some multibeam coverage exists (MBARI).

Habitat characterization of these to-be-mapped areas besides providing critical information to ONMS will also allow NOAA Okeanos Explorer to refine her mapping operations for habitat characterization.

2 CRUISE OVERVIEW

2.1 Background

This cruise is a mapping field trial cruise in the area of Cordell Bank NMS, designed to test and refine operations for conducting mapping operations for exploration using NOAA Ship *Okeanos Explorer* (EX) mapping and related systems and sensors.

In August 2008, NOAA Commissioned the EX as “America’s Ship for Ocean Exploration”. The EX is America’s first ship dedicated solely to ocean exploration and discovery. The ship carries cutting-edge technology that will enable explorers at sea and at Exploration Command Centers ashore to investigate the unknown and poorly understood ocean and its phenomena. Exciting new discoveries will be shared live through the Internet with everyone from top government policymakers to students learning about the mysterious ocean. The EX is a partnership program of exploration with NOAA’s Office of Ocean Exploration and Research (OER) and NOAA’s Office of Marine and Aviation Operations (OMAO) to systematically explore the world ocean.

Following Commissioning, the EX began a period of shakedown and field trials cruises. Field trial cruises are designed to refine operations, standard operating procedures, training, and utilization of ship systems and personnel in different defined modes of exploration. This cruise is a continuation of the field trial period.

NOAA Okeanos Explorer (EX) is equipped (at present) with three deep water mapping sonars including Multibeam echo sounder (EM 302, 30 kHz), single beam echo sounder (EA 600, 12 kHz) and Knudsen sub-bottom profiler (SBP, 3.5 kHz). The sonars have been heavily tested during earlier cruises in shallower and deeper waters and have been found to provide good bathymetric data, however, uncertainty remains about the efficacy of using these sonars for habitat characterization. The performance characteristics that are considered important for the EX mission and are expected to be tested during this cruise include depth vs. swath coverage curves of the EM 302, expected resolution and accuracy estimation of data collected in medium depth waters (<2500 m), EM 302 bottom and water column backscatter data quality, and ability of EM 302 to differentiate between different habitat types. These performance metrics are essential for planning future EX exploration voyages and will dictate the expected mapping results of exploration missions.

2.2 Goals and Objectives

The goals of this field trial cruise are more operational than exploratory. Like other field trials, this cruise has primary and secondary goals and objectives. Completion of primary goals and objectives will make the cruise a success. The primary goal and objectives will be achieved in the context of mapping in the vicinity of San Francisco, CA, predominantly Cordell Bank & Gulf of the Farallones NMS and their respective proposed Expansion Areas. Following are the primary and secondary goals objectives of this cruise:

2.2.1 Primary Goal: Test, troubleshoot, refine and evaluate EX mapping systems, sensors, protocols and processes to support systematic exploration.

2.2.1.1 Assess bottom backscatter data quality

EM 302 in addition to bathymetric data provide bottom backscatter data- which constitute of amount of sound energy scattered in the direction of the sonar. Backscattering is a function of the sonar frequency, seafloor hardness and roughness. Over last few years, several research initiatives have focused on using bottom backscatter to identify different habitat types. Onboard EX, bottom backscatter have been collected in recent cruises but no conscious efforts have been put in place to understand the quality of bottom backscatter data. This cruise will focus on processing bottom backscatter data while at sea and will try to identify any issues that need to be focused in building data pipeline for bottom backscatter.

At present no tools are available onboard to process bottom backscatter data. Mapping team will continue their efforts to acquire a bottom backscatter processing tool before start of the cruise. Shore support, if available, will be utilized to send the data on-shore to aid in data processing tapping into specialized tools being built at UNH.

2.2.1.2 Resolve EM302 and EA600 Interference with Knudsen Sub-bottom profiler

During earlier cruises, Knudsen SBP was observed to interfere with EM 302 and EA 600. Efforts will continue, in collaboration with OMAO, Knudsen and Kongsberg, during this cruise to resolve the interference issues.

2.2.1.3 Continue refining data products pipeline, documentation and sensor integration

A major focus of this cruise will be to continue to develop and improve methodologies to acquire, process, analyze and archive mapping data. Ancillary documentations in regards to standard operating procedures, system and wiring diagrams and operational reports will continue to be developed through out the cruise with special emphasis on bottom and water column backscatter data.

2.2.2 Secondary Goal: Continue preparations, training, testing and evaluating of other EX systems and sensors.

2.2.2.1 Mapping Cordell Bank & Gulf of the Farallones NMS priority areas and HR223 Expansion Areas, including Bodega Canyon

Use deepwater multibeam and backscatter to characterize deep water habitats (seafloor and water column) and locate habitat features (e.g., hard substrate, high slope, high rugosity) that could support diverse deep sea communities, including deep water corals and rockfish populations. These locations could be future targets for Remotely Operated Vehicles (ROV) to collect visual evidence of these critical habitats and communities.

2.2.2.2 VSAT trial

The details and requirements of any VSAT trials are undecided currently.

2.2.2.3 Preparation for July 24 PR event

On 24 July the ship will host a PR event with several NOAA dignitaries in attendance. The mission party will work with the ship staff to prepare the ship for this event.

2.2.2.4 CIMS trials

NCDDC staff (Freeman and Gordan) will assist the ship staff to complete following tasks. These tasks are expected to be carried out concurrently with other tasks and therefore no separate time will be dedicated to achieve these objectives:

1. Modifications to SCS data pipeline code to assist with automation on shore.
2. Troubleshoot problems with automatic metadata generation.
3. Investigate CTD output in XML format and metadata generation.
4. Create a FAQ/troubleshooting list for survey techs to accompany SOPs already provided.
5. Discuss products to be sent via DAC, create infrastructure for testing delivery of products to DAC on ship's network and test delivery pipeline.
6. Investigate automation of metadata for mapping products.
7. Test GoTo meeting between ship and shore to assist with remote data management and CIMS support.
8. Use CIMS and MERMAid-on-a-stick to generate FGDC files on the ship.
9. Review and refine metadata with the ship mapping staff.
10. Enhance current CIMS User's Manual (Getting Started Guide).
11. Create additional SOPs for using At-Sea module to assist in areas where it can be useful with minimal effort by crew including data pipeline graph/document.
12. Generate Situation Reports from CIMS and coordinate with mapping staff on content.
13. Generate spreadsheet products from CIMS (release all content) and review with mapping staff for usability.
14. If time permits, work with crew to determine other areas and possibly solicit inputs for At-SeaV2 requirements.

NCDDC has provided following requirements regarding hardware, software, and personnel:

- a. **Hardware** -- Access to two workstations, one of which must be able to KVM-switch to the SCS-A server. If a second workstation is not available, or only partially available, then work from a laptop brought from NCDDC is possible if it can "see" the SCS server.
- b. **Software** -- No requirements identified at this time.
- c. **Personnel**
 - Minimal ET support is anticipated and mainly to get laptops on the ship's network, ship's network account creation, and possible to answer some question throughout the cruise.
 - Survey tech interaction is desired for some objectives but we are also aware of additional constraints that this cruise will be imposing on their time. Hopefully at least a few hours throughout the cruise might be available for meetings, discussions, and possibly additional CIMS training.

2.3 Participating Organizations

NOAA – Office of Ocean Exploration and Research (OER)
1315 East-West Hwy, Silver Spring, Maryland 20910

NOAA – Pacific Marine Environmental Laboratory (PMEL)
7600 Sand Point Way N.E., Seattle, Washington 98115-6439

UNH – University of New Hampshire, Center for Coastal and Ocean Mapping (CCOM)
Jere A. Chase Ocean Engineering Lab, 24 Colovos Road, Durham, NH 03824 USA

NOAA – West Coast Region, Office of National Marine Sanctuaries (ONMS)
99 Pacific Street 200K, Monterey, CA 93940

3 PERSONNEL

It is envisioned that EX will carry out 24 hours mapping operations during this cruise. Therefore, the requirement is for 6 watch keepers (2 for each watch) for mapping sensors data acquisition and data processing.

Onboard Personnel

Name	Affiliation	Role	Dates	M/F	Status
Malik, Mashkoor	OER (ERT)	Expedition Coordinator	14 July to 24 July	M	US Permanent Resident
Anglin, Lorraine	ONMS	Mapping	14 July to 24 July	F	US citizen
Christopher Paul	OER intern	Mapping	14 July to 24 July	M	US citizen
Elena R Crete	OER intern	Mapping	14 July to 24 July	F	US citizen
Gregory M Beadle	OER intern	Mapping	14 July to 24 July	M	US citizen
Andrea LeBarge	OCS intern	Mapping	14 July to 24 July	F	US citizen
Sam Baldwin	OER intern	Mapping	14 July to 24 July	M	US citizen
Denise Gordon	NCDDC	CIMS	14 July p 24 July	F	US citizen
McKinley Free man	NCDDC	CIMS	14 July to 24 July	M	US citizen

3.1 Remotely Participating Personnel

The following personnel will participate or be available to participate from shore via limited communications at Exploration Command Centers.

Name	Affiliation	Role	Dates	M/F	Status	ECC
Russell, Craig	OER (ERT)	EX Program Planner	14 July to 24 July	M	US	PMEL
McDonough, John	OER	Deputy Director, Backup Expedition Coordinator	14 July to 24 July	M	US	SSMC

3.2 Participating Organization Acronyms

OER – NOAA OAR Office of Ocean Exploration and Research

ERT – ERT, Inc, a NOAA Contractor

2020 – 2020 LLC, a NOAA Contractor

EO – Eastern Oceanics, a NOAA Contractor

UNH CCOM – University of New Hampshire Center for Coastal and Ocean Mapping

ONMS – NOAA Office of National Marine Sanctuaries

3.3 Foreign Nationals – NOT APPLICABLE TO THIS CRUISE

See Section 8.2 for details regarding foreign nationals, including the responsibilities of the OER Expedition Coordinator, Commanding Officer and foreign national sponsor.

4 ADMINISTRATION

4.1 Ship's Location

The ship will be docked in Astoria, OR starting June 27, 2009 at Pier 1, next to the Maritime Memorial Park on the SE side of the bridge.

The ship will dock in San Francisco, CA, starting July 23, 2009. Actual Pier TBD.

4.2 Key Points of Contact

4.2.1 Ship Operations

Marine Operations Center, Atlantic (MOA)
439 West York Street
Norfolk, VA 23510-1145
Telephone: (757) 441-6776
Fax: (757) 441-6495

Chief, Operations Division, Atlantic (MOA1)
CDR Keith Roberts
Telephone: 757-441-6842
E-mail: ChiefOps.MOA@noaa.gov

Marine Operations Center, Pacific (MOP)
1801 Fairview Avenue East
Seattle, WA 98102-3767
Telephone: (206) 553-4548
Fax: (206) 553-1109

Chief, Operations Division, Pacific (MOP1)
CDR Mike Francisco
Telephone: 206-553-8705
Email: ChiefOps.MOP@noaa.gov

4.2.2 Mission Operations

Mashkoor Malik, Physical Scientist
NOAA Ocean Exploration & Research (ERT,
Inc.)
Phone: 603-862-4332 / 603-377-6319
E-mail: mamalik@cisunix.unh.edu

Craig Russell, EX Program Planner
NOAA Ocean Exploration & Research (ERT,
Inc.)
Phone: 206-526-4803 / 206-518-1068
E-mail: craig.russell@noaa.gov

Nicola Verplanck, Field Operations Officer
NOAA Ship *Okeanos Explorer*
Phone: 321-960-3726
E-mail: Nicola.Samuelson@noaa.gov

4.2.3 Other Mission Contacts

Craig Russell, EX Program Planner
NOAA Ocean Exploration & Research (ERT,
Inc.)
Phone: 206-526-2803 / 206-518-1068
E-mail: Craig.Russell@noaa.gov

John McDonough, Deputy Director
NOAA Ocean Exploration & Research
Phone: 301-734-1023 / 240-676-5206
E-mail: John.McDonough@noaa.gov

4.3 Shipments

For all shipments to the ship please coordinate with OPSO and cruise coordinator.

4.4 Shipboard Meetings

Daily Operations Briefing meetings will be held at 1530 Local time in the forward lounge to review the current day, and define operations, associated requirements and staffing needs for the following day. A Plan of the Day (POD) will be posted each evening for the next day in specified locations through out the ship. Daily Situation Reports (SITREPS) will be posted as well and shared daily through e-mail and/or the EX PLONE site (<http://terra.gso.uri.edu/NOAAShipOkeanosExplorer>)

4.5 Medical Clearance

All personnel will satisfy NOAA Health and Safety requirements, completing and providing NHSQ and PPD (Tuberculosis test) test results before boarding.

The revised NHSQ can be found at <http://www.oma.noaa.gov/medical.html>. Clearances are valid for 2 years for personnel under age 50 and 1 year for age 50 and over. All PPD's expire after one year from the date of administration.

Cruise participants will follow standard protocols described in the NHSQ, and will fax completed forms to CDR Pelkey as follows:

CDR Michelle Pelkey

Fax: 206-553-1112

5 OPERATIONS

Following is a description of the data to be collected, including: specific sensors or systems used; the operations implementation plan, including staging, conducting operations (on-station, underway) and de-staging; station or trackline geographic information, and any other operations requirements.

5.1 Data to be collected

As a field trial cruise, the primary data collected is evaluation and assessment information of operations, protocols, systems and processes. The secondary data collection objective is acquiring mapping data useful to ONMS and other users. Following is a list of sensor measurements that will be required to accomplish the primary and secondary objectives:

5.1.1 Primary Systems and Sensors

- Kongsberg Simard EM302 Multibeam Echosounder (MBES)
- Kongsberg Simrad EA600 Deepwater Echosounder
- Knudsen 320BR Sub-bottom profiler (SBP)
- LHM Sippican XBT (various probes)
- Seabird SBE 911 Plus CTD
- Seabird SBE 50 CTD Stand
- CNAV GPS
- POS/MV
- Seabird SBE-45 (Micro TSG)
- Kongsberg Dynamic Positioning-1 System
- NetApp mapping storage system
- CARIS HIPS Software
- SIS Software
- Hypack Software
- Scientific Computing System (SCS)
- ECDIS
- Met/Wx Sensor Package

5.1.2 Secondary Systems and Sensors

- Telepresence System
- VSAT High-Speed link (Comtech 20 Mbps and 10 Mbps ship to shore)

5.1.3 Staging Plan

On July 13, 2009 the mission party will embark on the EX and begin preparations. All additional equipment to be brought aboard by the mission party will be shipped to the address provided by the ship. This equipment shall be loaded by the mission party onto EX no later than COB 13 July-2009 and placed in the wet lab or other appropriate destination location aboard the EX and ensure proper stowage, installation and securing of the material. The mission party is responsible for arranging all necessary transportation of material and personnel to and from the ship. Mission personnel will coordinate with the Ship Operations Officer for any ship services required to assist with loading mission materials. Crane service requests must be requested by the mission party 24 hours in advance of the required loading time.

5.1.4 De-Staging Plan

Upon return to port in San Francisco on 23-July-2009, the mission party shall dismantle any additional equipment brought aboard for removal no later than COB 23-July-2009. The mission party is responsible for arranging all necessary transportation of material and personnel to and from the ship. Mission personnel will coordinate with the Ship Operations Officer for any ship services required to assist with unloading transient mission materials. Crane service requests must be requested by the mission party 24 hours in advance of the required loading time.

EX is expected to participate in a high level media event on 24 July. Therefore it is absolutely necessary that mission party comply with cleaning / clearing instructions by COB 23-July-2009 to make the ship ready for the media event.

In case extra help is needed by the ship to prepare for the media event, mission party will be notified on 23 July to stay onboard 24 July and help with the media event.

5.2 Cruise Implementation Plan

The shipboard EM 302 and EA 600 will be operated around the clock (24 hours per day) during this cruise. SBP will also be operated simultaneously provided interference issues between the EM 302 and EA 600 are resolved before the cruise. Multibeam data will be processed, and digital terrain maps will be developed to assist in day to day planning and operational decisions. XBT/CTD data will be collected in survey regions to improve the quality of the multibeam data acquisition.

5.2.1 Evaluation of EM 302 bottom and water column backscatter data

Detailed analysis of EM 302 bottom and water column backscatter data has been due pending implementation of Kongsberg of EM 302 backscatter calibration and unavailability of appropriate processing tools. Water column processing tool is now available (IVS Fledermaus Ver. 7 Beta) with EX, evaluation of EM 302 water column processing will enable testing to determine efficacy of EM 302 for detection of different water column targets including fish schools, hydrothermal vents, deep plankton layers etc. Bottom backscatter processing tool will be brought by mission party onboard. No special maneuvers are anticipated for testing of backscatter data at this time.

5.2.2 Continue working on data products pipeline, documentation and sensor integration

The EX and OER teams collaborated over the last year to develop, refine and document the mapping data products pipeline, documentation (SOPs) and sensor integration. All cruise activities will result in additional information to be captured in these ongoing documents and activities.

5.3 Detailed Operations Schedule

The following tables and figures provide a detailed representation of the planned schedule and cruise track. Any revised locations will be provided prior to the arrival of the mission party to the EX. Mapping operations presume a vessel speed of 9 knots. Transit operations presume a maximum vessel speed of 10 knots and average or likely speed of 9 knots. CTD operations will be conducted while holding station. XBT operations presume a vessel speed of 6-10 knots.

Table 1. List of projected major operations associated with performance evaluation of mapping sensors. Operating dates and locations are subject to change based on sequential satisfactory performance of the mapping sensors.

Dates (mm/dd)	Location	Operations	Time (Days) Approximate	Distance (nm) Approximate
07/14	Astoria, OR	Departure		
07/14- 07/16	Transit to Cordell Bank (CB) NMS	(a) Transit (b) Investigate Knudsen interference (c) Conduct CTD cast before start of mapping operations	2.5	500
07/17- 07/20	Potential CB and Potential Gulf of the Farallones (GF) area expansion area (Priority 1 and 2)	EM 302 Mapping	4	848
07/21- 07/22	ONMS mapping priority area 3	EM 302 Mapping	1.5	648
07/23	Arrival San Francisco, CA	Arrival	0.5	
Total			8.5	1556

Table 2. Approximate mapping locations for this cruise.

	Approx Depths (m)	Bounding box location (Not to be used for Navigation) Long Lat		Approx. linear distance
CTD cast				
ONMS priority 1 (HR223 potential CB expansion) area	500 m – 3,000 m	-123.7507	37.6710	
		-123.3861	37.8576	
		-123.4176	37.9545	
		-123.5183	38.1044	
		-123.4151	38.1373	
		-123.4091	38.1741	
		-123.5747	38.5097	
		-124.0887	38.3450	
ONMS priority 2 (HR223 potential GF expansion) area	500 m – 3,000 m	-123.7569	37.6711	
		-124.0830	38.3429	
		-123.6554	38.4859	
		-123.7765	38.6353	
		-124.1626	38.4920	
ONMS mapping priority area 3	500 m – 3,000 m	-124.0830	38.3422	
		-123.3721	36.7978	
		-122.8663	37.1405	
		-122.9576	37.2586	
		-122.9258	37.3324	
		-122.9949	37.4554	
		-122.9829	37.5699	
		-123.2030	37.7473	
		-123.3887	37.8608	
		-123.7481	37.6740	
		-123.7240	37.3049	
		-123.3761	36.8055	
		-122.8694	37.1336	

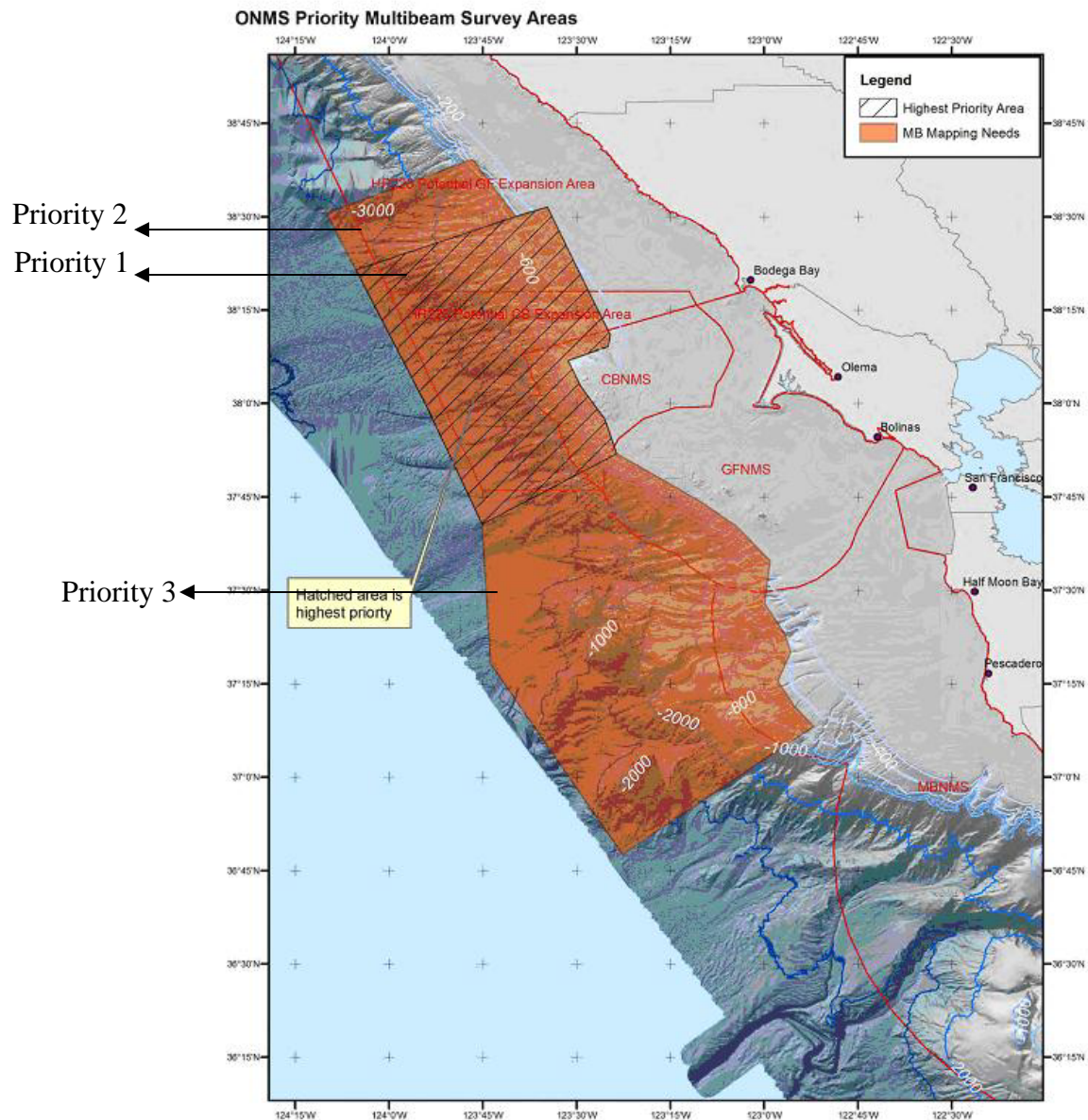


Figure 1: Location of mapping areas.

As shown in Table 1, mapping will first focus in priority 1 and 2 areas. Once finished with mapping priority area 1, remainder of the cruise will be dedicated to working in the priority 3 area. Detailed line plan will be provided to the ship before start of the mapping operations.

5.4 Station Operations

The following station operations will be conducted during this cruise. The procedures for these operations can be found in Standard Operating Procedures aboard the EX.

- CTD casts
- XBT casts (various probes)

5.5 Underway Operations

The following underway operations will be conducted during this cruise. The procedures for these operations can be found in Standing Operating Procedures aboard the EX.

- Mapping operations using EM302, EA600 and Knudsen 320BR
- XBT casts (various probes)
- TSG Monitoring
- SCS Data Acquisition
- Meteorological Data Acquisition
- Data processing of EM 302 data

5.6 Applicable Restrictions

None.

5.7 Small Boat Operations

No small boat transfers or operations are requested at this time. However, based on the requirement for VSAT tests / trials a small boat operation / personnel transfer may arise.

6 FACILITIES

6.1 Equipment and Capabilities Provided by the EX

- EM302 Mapping System
- EA600 Echosounder System
- Knudsen 320 BR Subbottom profiler system
- POS/MV
- CNAV DGPS
- SCS System
- Dynacon Hydrographic Winch with .32" 8000m electromechanical conductor cable terminated for CTD operations, positioned for use with the starboard J-Frame.
- Starboard J-Frame rigged to Dynacon Hydrographic Winch.
- Manual Wire Angle indicator for CTD casts
- Sea-Bird Electronics' SBE 911plus CTD system with stand, including underwater CTD, weights, pinger and deck unit.
- Conductivity and temperature sensor package to provide dual sensors on the CTD (primary)
- LHM Sippican XBT system and probes
- Telepresence System
- NetApp network storage devices
- Color copier and printer
- Mission party computer and network access
- Desk and workspace in the dry and wet-labs
- Adequate deck lighting for night-time operations
- Navigational equipment including GPS and radar
- Safety harnesses for working on quarterdeck and fantail

- Ship's crane(s) used for loading and/or deploying
- Limited rain gear for inclement weather
- Hard hats for deck operations
- Berthing and meals for embarked personnel

6.2 Equipment and Capabilities Provided by the Mission Party

- Ancillary mission laptop computers
- Ancillary mapping processing workstation
- Specialized water column and bottom backscatter data processing tool

7 OPERATIONAL RISK MANAGEMENT

For every operation to be conducted aboard the ship (NOAA-wide initiative), risk management procedures will be followed. For each operation, risks will be identified and assessed for probability and severity. Risk mitigation strategies / measures will be investigated and implemented where possible. After mitigation, the residual risk will have to be assessed to make Go-No Go decisions for the operations. Particularly with new operations, risk assessment will be ongoing and updated as necessary. This does not only apply to over-the-side operations, but to everyday tasks aboard the vessel that pose risk to personnel and property.

- CTD (and other pertinent) ORM documents will be followed by all personnel working on board the EX
- All personnel on board are in the position of calling a halt to operations/activities in the event of a safety concern.

8 MISCELLANEOUS

8.1 Communications

Specific information on how to contact the NOAA Ship *Okeanos Explorer* and all other fleet vessels can be found at:

<http://www.moc.noaa.gov/phone.htm>

8.1.1 Important Telephone and Facsimile Numbers and E-mail Addresses

8.1.1.1 Ocean Exploration and Research (OER):

OER Program Administration:
Phone: (301) 734-1010
Fax: (301) 713-4252
E-mail: Firstname.Lastname@noaa.gov

8.1.1.2 University of New Hampshire, Center for Coastal and Ocean Mapping

Phone: (603) 862-3438
Fax: (603) 862-0839

8.1.1.3 NOAA Ship Okeanos Explorer - Telephone methods listed in order of increasing expense:

United States Coast Guard – San Francisco, California:

Primary Phone: (415) 399-3547

Emergency Phone: (415) 556-2103

Fax Number: (415) 399-3521

EX Cellular:

OOD (401) 378-7414

EX Iridium:

808-659-9179

EX INMARSAT B

Line 1: 011-872-764-852-328

Line 2: 011-872-764-852-329

Mission personnel may obtain access to these systems with permission from the Commanding Officer on a cost-reimbursable basis.

E-Mail: Ops.Explorer@noaa.gov (mention the person's name in SUBJECT field)

8.1.1.4 Marine Operations Center, Pacific (MOP):

Operations Division (MOP1)

Phone: (206) 553-4548

Fax: (206) 553-1109

E-Mail: FirstName.LastName@noaa.gov

E-Mail to Radio Room: Radio.Room@noaa.gov

8.1.1.5 Marine Operations Center, Atlantic (MOA):

Operations Division (MOA1)

Phone: (757) 441-6206

Fax: (757) 441-6495

8.2 Foreign Nationals

Not Applicable

9 DISPOSITION OF DATA

9.1 Responsibilities

9.1.1 Shipboard

9.1.1.1 Responsibilities

9.1.1.1.1 Ship

The Commanding Officer is responsible for all data collected for missions until those data have been transferred to mission party designees. Data transfers will be documented on NOAA Form 61-29. Reporting and sending copies of project data to NESDIS (ROSCOP form) is the responsibility of OER.

9.1.1.1.2 NOAA OE

(Develop boilerplate wording over time to include NOAA OE data policies.)

9.1.1.2 Deliverables

- a. At sea
 - Daily plans of the Day (POD)
 - Daily situation reports (SITREPS)
- b. Post cruise
 - Refined documentation on ROVs, ROV control room and telepresence system.
 - Refined SOPs for use of control room and telepresence system.
 - Strategy for preparing for FY 09 operations.
 - Assessments of all activities.

9.1.1.3 Archive

- The Program and ship will work together to ensure proper archive of metadata and acquired data sets, and that all metadata and data formats meet FGDC compliance. Details TBD.

9.1.2 Deliverables

9.1.2.1 At sea

9.1.2.1.1 Daily plans of the Day (POD)

9.1.2.1.2 Daily situation reports (SITREPS)

9.1.2.2 Post Cruise

9.1.2.2.1 Refined SOPs for water column mode of exploration

9.1.2.2.2 Data sets from CTD profiles

9.1.2.2.3 Mapping data from multi-beam operations

9.1.2.2.4 Assessment of all activities

9.1.2.3 Archive

- The Program and ship will work together to ensure proper archive of metadata and acquired data sets, and that all meta data formats meet FGDC compliance.

10 ADDITIONAL PROJECTS

- 10.1 Definition** - Ancillary and piggyback projects are secondary to the objectives of the cruise and should be treated as additional investigations. The difference between the two types of secondary projects is that an ancillary project does not have representation aboard and is accomplished by the ship's force.

NONE

11 HAZARDOUS MATERIALS

The field party chief shall be responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements of Visiting Scientists, July 2002

NONE